

The use of roselle (*Hibiscus sabdariffa*) in combatting food insecurity in Sub-Saharan Africa

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Benefits of African Indigenous Vegetables (AIVs)

FOOD SECURITY

African Indigenous Vegetables (AIVs) are native or naturalized plants that are used as foods, medicinal and ornamental plants. In Sub-Saharan Africa (SSA) around 528 species are used as AIVs.¹ These plants are utilized widely in SSA though have been subjected to relative little scientific investigation and have been considered minor or orphan crops. Yet, the AIVs have the potential to dramatically increase the economic development of smallholder farmers and household/community nutrition with increased consumption. AIVs can be used as a source of nutrient rich food, medicine, cash crops, and for use in other markets such as cosmetic or fragrance.² Growing indigenous plants has the benefits of decreased water needs, increased climate tolerance; fewer inputs needed and increased profits from sale to niche markets.

BENEFITS

AIVs including Moringa (*Moringa olifera*), African Spiderplant (*Cleome gynandra*), African Nightshade (*Solanum spp.*), Amaranth (*Amaranthus spp.*), Roselle (*Hibiscus sabdariffa*) are popularity in many regions of SSA and rich in vitamins, minerals, phytochemicals and other secondary metabolites that make these crops multipurpose and diversified sources of income for smallholder farmers. Using AIVs, farmers have been able to obtain greater returns from markets as well as use 50 percent less fertilizer and 30 per cent less pesticide than for conventionally grown vegetables.³ By growing crops native to the region farmers will be able to capitalize on the genetic adaptation present in the crops to buffer against the inherent risk of farming.

SMALLHOLDER FARMERS

AIVs can allow smallholder farmers to compete with the medium and large sized farms by allowing them to grow more labor intensive but higher priced specialty crops. By diversifying the crops grown small farms can stay relevant and profitable into the future without relying always on everyone growing the same variety of the crop at the same time for the same limited market.

Roselle (*Hibiscus sabdariffa*) as a new crop for New Jersey and Sub-Saharan Africa

OVERVIEW

Hibiscus sabdariffa (common names: roselle, gongura, bissap, Jamaican sorrel) is a shrub-like, drought tolerant, and indeterminate tropical plant. The fleshy outer casing of the seeds, called the calyx, is a most popular herbal tea, tastes similar to cranberry and is used for jams, jellies, wine, tea, and as a natural coloring agent.⁴ The leaves are similar to spinach and are consumed raw in salads or cooked. The origin of roselle is unknown (potentially South East Asia or Eastern Africa).⁵

GROWTH

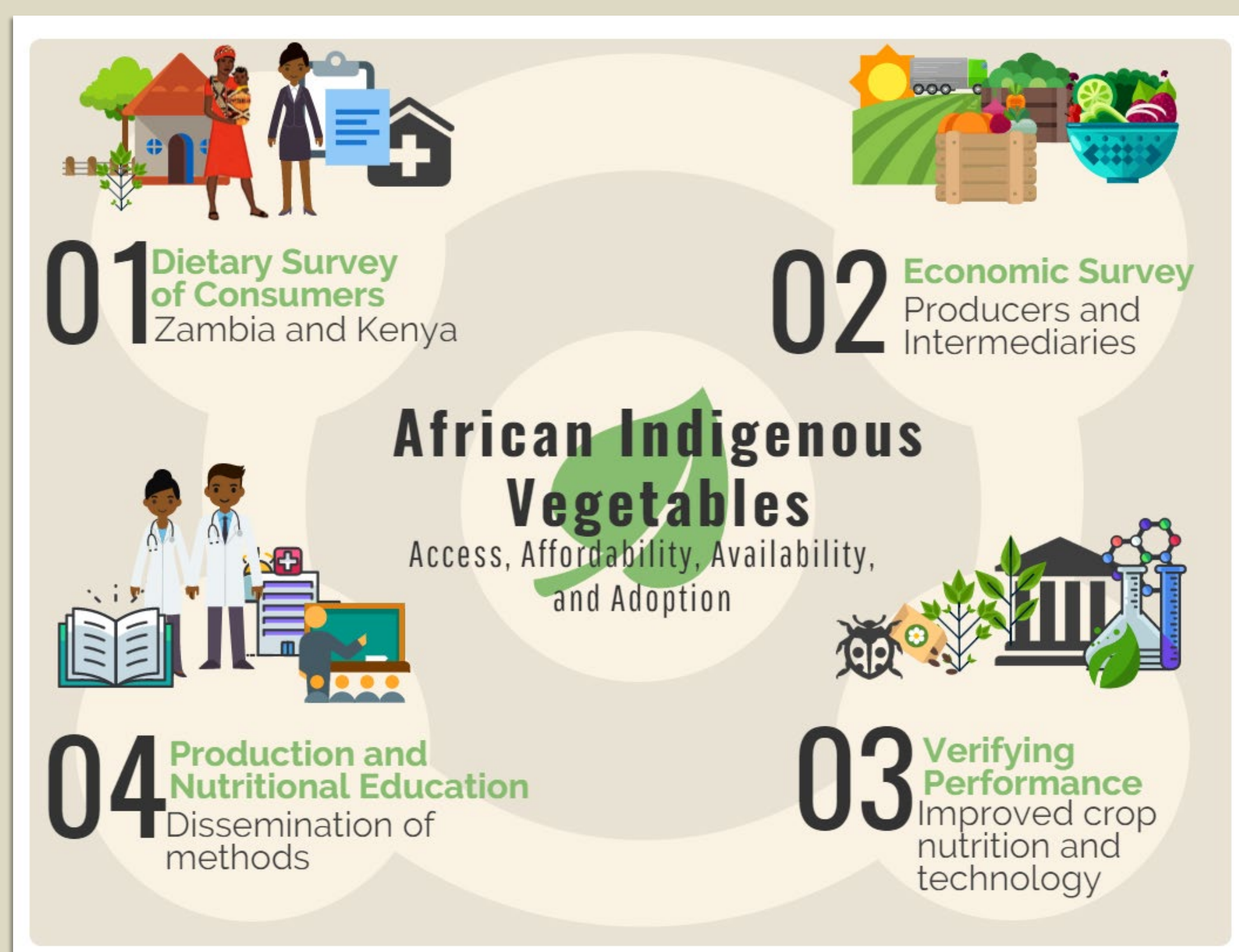
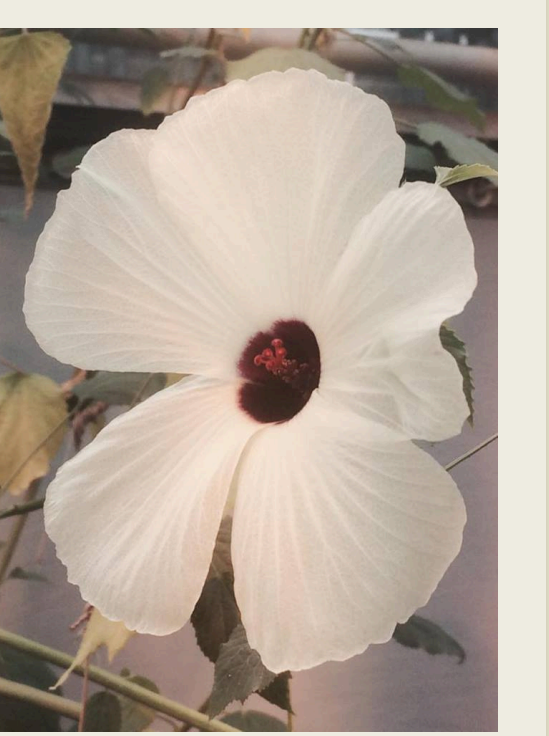
Today roselle is grown commercially for its calyces in China, India, Sudan, Uganda, Indonesia, Malaysia, Mexico and now the United States in Florida, California, Louisiana, and Kentucky.⁶ Currently, our has been working on the breeding of roselle, the bioactivity of the anthocyanin pigments as well as in examining the nutrition of the calyze and leaves. Our first decade of work focused on the calyx. Our current focus has been on developing the nutritious and abundant leaves for consumption without compromising high quality calyx production for economic benefits.

NUTRITIONAL BENEFITS

The calyces are shown to have anti-inflammatory activity, cancer prevention and liver protection activities due to the high content of anthocyanins (the colored pigments found in the fruits and flowers). The leaves are shown to have anti-oxidant, antihyperlipidemic, anit-atherosclerotic and anti-proliferation activity.⁷

IMPLICATIONS FOR FOOD SECURITY

Roselle has the potential to address many concerns such as: nutritional concerns, gender equality, interest of foreign markets and increase the economic power of farmers and rural communities- and importantly is a crop that is culturally accepted across sub-Sahara Africa, is easy to grow, and adapted to poor soil conditions where water is limited, often where the subsistence farmers are located.



New Use Agriculture and Natural Plant Products Lab at Rutgers University

MISSION STATEMENT

This program seeks to bring together botany, ethnobotany, environmental science horticulture, agronomy, genetics, chemistry, food science, medicinal chemistry into a single unique program to develop new crop production, processing, product standardization, to identify new bioactive compounds that are of potential health or commercial interest.

AFRICAN INDIGENOUS VEGETABLE PROJECT

African Indigenous Vegetables (AIVs) have unrealized potential to improve the health status of at-risk populations. Working with influential organizations in Zambia, Kenya, and Tanzania we are identifying and addressing the most critical limiting factors on consumption of AIVs. Through the following activities, our overall goal is to increase access, affordability, availability, and adoption of AIVs. This project is funded by the Horticulture Innovation Lab and the USAID.

Results

EDUCATIONAL MATERIALS

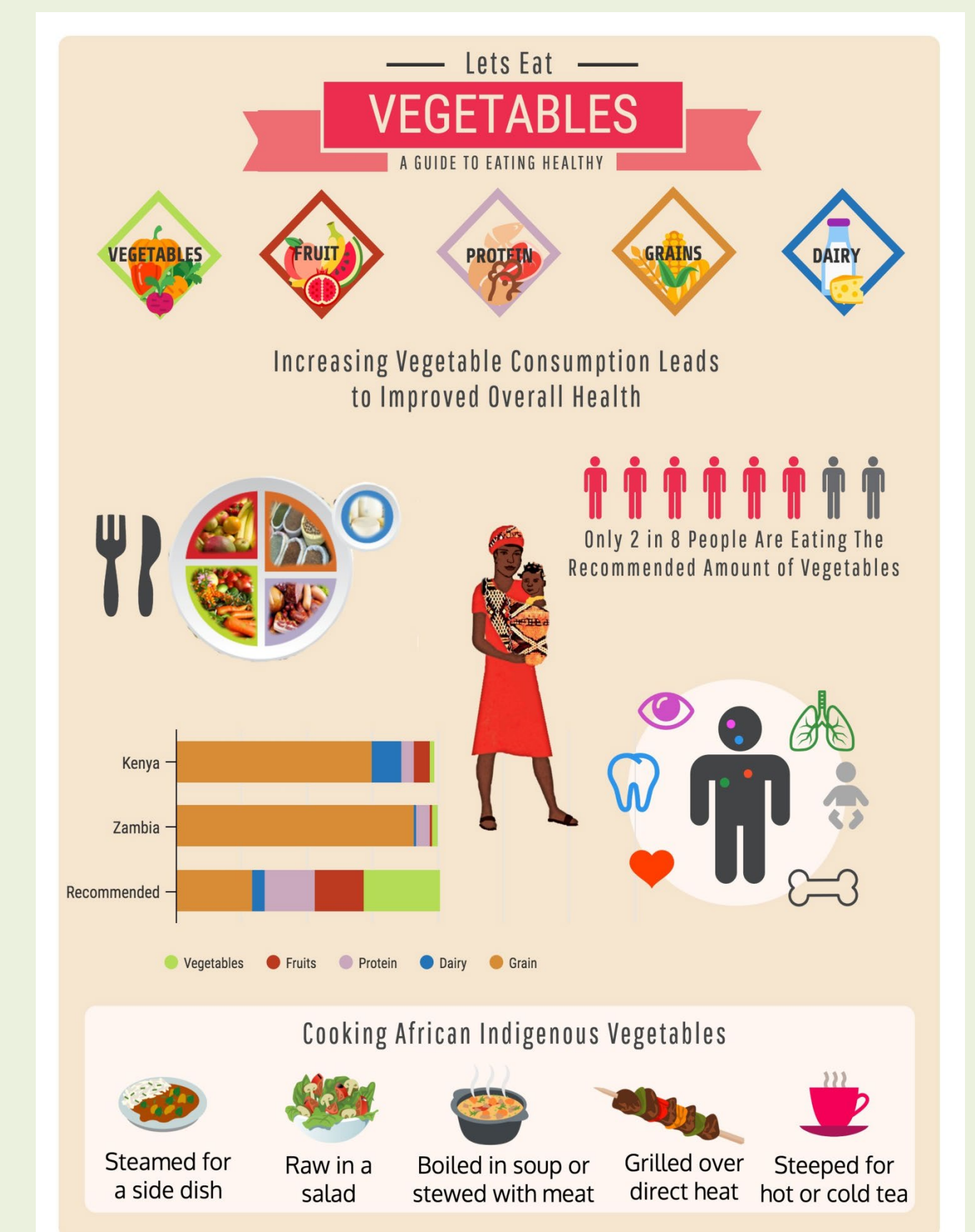
Educational materials, courses, and training focused on nutritional programs for consumers, farmer education for growing new crops, and information for businesses interested in selling AIVs and their value added products.

TECHNOLOGY

Improved tools for harvesting and post-harvest processing, including handheld tools for faster roselle calyx harvesting developed in Senegal, and chilling technology for the storage of produce. By working with communities to develop new tools we are ensuring that the solutions we create are meaningful, beneficial, and relevant.

IMPROVED CROPS

Distribution of improved crops as well as educational programs in order for farmers to keep selecting and improving their own seed material.



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